These sandstones are unfossiliferous, and an absolute proof of their Eocene age must accordingly be wanting; but, *faute de mieux,* Dr. Falconer makes out an excellent case and presents his facts clearly.

The book concludes with chapters on "The Superficial Accumulations," "Tertiary Crustal Movements," and "Tertiary Volcanic Action," each worthy of the close attention of the student of African geology. Two periods of Tertiary volcanic activity are recognised, respectively middle Eocene and late Pliocene; to the latter are referred some excellently preserved puys (Fig. 2) developed in the Province of Yola, the middle Benue valley and on the Bauchi plateau.

The rocks of the earlier outburst are an interesting series of phonolites and nepheline-basalts, of which the conspicuous stumps of the Tangale Peak and the Wase rock may be taken as typical examples.

In regard to the late earth movements, one conclusion of general interest may be recorded here, viz., that the culmination of the Tertiary oscillation resulted in the formation of the Bauchi plateau and the establishment of the present river system.

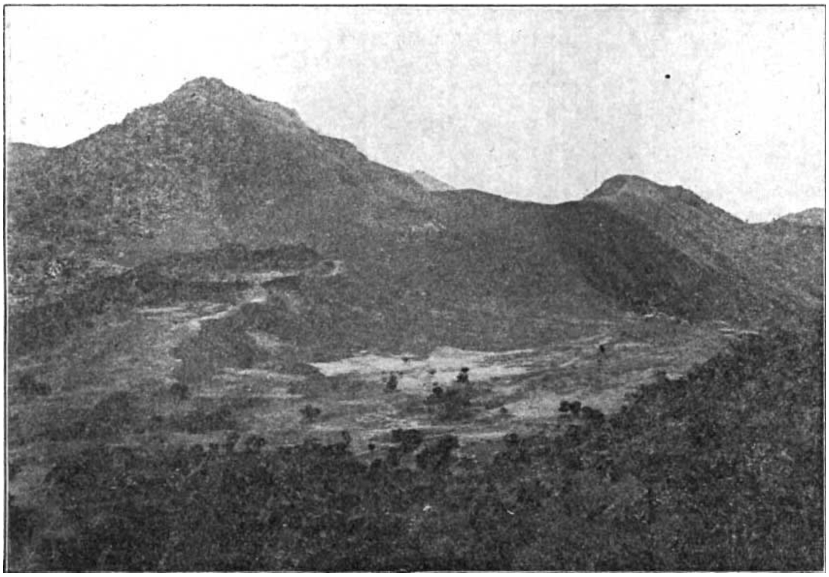

FIG. 2.—Craters in the Mboi Hills. From "The Geology and Geography of Northern Nigeria."

The Bauchi district is inseparably connected with the tin industry, and we could wish that Dr. Falconer had seen his way to more details, put in plain and concise phraseology, of the alluvium-containing cassiterite.

The sudden prominence into which the tin-mining industry has burst in northern Nigeria naturally leads the reader, in such a work as this, to expect authoritative information in a form to be readily assimilated.

Mr. Henry Woods has contributed an appendix on the palæontology, and the book as a whole is full of valuable information to the student; the geological map on a scale of 1 : 2,000,000 is indispensable to those interested in the structure of this part of Africa.

As Dr. Falconer himself readily admits, his work may require some modification in the future, but all who are acquainted with the difficulties of the African pioneer will give him full measure of praise for the results he has attained. In such circumstances to quibble over detail is an ill task, but the first chapter on the "Physical Geography" might be compressed and summarised with advantage to the general reader, and perhaps many will find a too great elaboration of detail throughout the work. JOHN PARKINSON.

DR. HARRY BOLUS.

THE name of Dr. Harry Bolus is closely associated with the story of South African botany for the last forty years. In April, 1874, a letter to Sir Joseph Hooker was read at a meeting of the Linnean Society, of which Bolus had recently been elected a fellow (December 18, 1873), in which he criticised Grisebach's limitation of the Cape and Kalahari floral provinces (see Journ. Linn. Soc., xiv.). This was the beginning of a series of publications embodying the results of his observations on the flora of a peculiarly rich and attractive botanical area. In 1886 Bolus wrote for the official handbook of the Cape of Good Hope a valuable "Sketch of the Flora of South Africa," in which he proposed a series of natural botanical divisions, forming, roughly, successive zones from the coast northwards. From 1881 to 1889 he communicated to the Linnean Society a number of contributions to South African botany, containing critical notes on various genera and species, as well as descriptions of many novelties; but it was to the heaths and orchids that he was especially devoted. The results of his study of the large and intricate genus Erica are found in his monograph (in part of which he had the help of the late Prof. Guthrie) in the "Flora Capensis" (vol. iv., sect. 1, issued in 1905), where the 469 species are described in detail, and arranged under forty-one sections.

In his volumes on South African orchids, Dr. Bolus has established a model of detailed description and illustration; accompanying each species is a plate, drawn by Dr. Bolus himself, in which a judicious combination of outline and colour gives exactly what is wanted by the botanical student. Dr. Bolus had just completed this important work at the time of his death, which occurred on May 25, when on a visit to England. Mention should also be made of the excellent series of specimens illustrating the Cape flora, by the distribution of which to various great herbaria Dr. Bolus brought his collections within reach of a large number of students of systematic botany. An account of his services to botany would be incomplete without a reference to his generous support of the Cape University, which owes to him the foundation of its chair of botany; and Dr. Bolus himself would have wished some acknowledgment to be made of the help which he received in all his later work from his niece and pupil, Miss Louisa Kensit. A. B. R.

NOTES.

THE Croonian lecture of the Royal Society will be delivered on June 15 by Prof. T. G. Brodie, F.R.S., on "A New Conception of the Glomerular Activity."

ON Tuesday, June 13, Prof. Ernst Cohen, of the University of Utrecht, will give an illustrated lecture before the Faraday Society on "Allotropic Forms of Metals." Prof. T. W. Richards, of Harvard College, has been invited to take the chair on this occasion. Applications for tickets should be made to the secretary, 82 Victoria Street, London, S.W.

PROF. A. WILLEY, F.R.S., of McGill University, Montreal, has directed our attention to the inclusion in his article "Amphioxus" in the eleventh edition of the "Encyclopædia Britannica" of two cuts (Figs. 2 and 3) which, though described there as "original," and therefore inferentially as drawn by himself, are really reproduced from Sir E. Ray Lankester's article "Vertebrata" in the ninth edition. We understand that these illustrations of amphioxus were added to Dr. Willey's article without his knowledge by the editor of the zoological section of the eleventh edition, in accordance with his scheme for the reorganisation of the whole series of articles; but, by an oversight, the description "original" was not altered to "Lankester," as it should have been. We have received a letter from the editor-in-chief regretting the error, which will now be corrected, and making it clear that Dr. Willey himself is not responsible for what might appear to ignore the original work of another distinguished zoologist.

THE fine collection of African birds formed by the late Mr. Boyd Alexander, and bequeathed by him to the Natural History Museum, has now been handed over to that institution by his executor, Mr. Robert Alexander. The collection includes the birds obtained by Mr. Alexander during his expeditions to the Cape Verde Islands, the Zambezi and Kafue Rivers, the Gold Coast Hinterland, and the Island of Fernando Po, as well as those secured during the Alexander-Gosling expedition in 1904–7 from the Niger to the Nile. The collection includes, also, all the specimens obtained during his last journey to the islands of San Thomé, Principe, and Annobon, in the Gulf of Guinea; on the Peak of Cameroon and mountains to the north; and in Wadai up to the time of Mr. Alexander's death. This bequest to the Natural History Museum is of great value, for it supplies beautifully prepared skins and complete series of the avifauna of islands and countries hitherto very imperfectly represented in the national collection of birds. The present collection comprises nearly 4000 bird-skins, and includes the type-specimens of no fewer than eighty species described for the first time by the late Mr. Alexander in his papers published in *The Ibis* and elsewhere.

WITH the object of promoting and systematising chemical work of general importance to all engaged in the development of that science by research or by teaching, an International Association of Chemical Societies has been formed as the result of a conference of delegates from the chemical societies of England, France, and Germany, held in Paris on April 25 and 26. The three leading societies of the countries named had been invited by the president of the Chemical Society of France to cooperate in this movement and to nominate delegates to represent their respective societies at the inaugural meeting. The representatives of the Chemical Society of London were Prof. P. F. Frankland (president), Prof. Meldola, and Sir Wm. Ramsay. The Chemical Society of France was represented by Profs. Béhal, Haller, and Hanriot, and the German Chemical Society by Profs. Jacobson, Ostwald, and Wichelhaus. With the exception of Prof. Meldola, who was unable to attend, all the delegates were present at the opening meeting, when the association was formally founded and the statutes framed and adopted. From these statutes we learn that the objects of the association are to be promoted by the appointment of committees charged with the consideration and investigation of questions submitted by the council, by the publication of the results of such investigations, and by the holding of conferences and congresses. It was decided at the opening meeting that the first international committees should be appointed for dealing with the questions of nomenclature in mineral and organic chemistry, and with the unification of the modes of stating physical constants. The next meeting of the association is to be held in Berlin on April 13, 1912, with Prof. Ostwald as president, and the 1913 meeting is to be held in Great Britain.

THE death is announced, at seventy-two years of age, of Dr. A. E. Törnebohm, the Swedish geologist.

THE twenty-second annual conference of the Museums Association will be held at Brighton on July 10–15 under the presidency of Mr. H. M. Platnauer.

THE President of the Board of Education has appointed Mr. H. H. Thomas to succeed Dr. J. S. Flett as petrographer to the Geological Survey of Great Britain.

PROF. JOHANNES HARTMANN, professor of astronomy at Göttingen and director of the University observatory there, has been appointed, says *Science*, director of the Argentine Observatory at La Plata.

MR. A. J. WILMOTT, late scholar and Hutchinson student of St. John's College, Cambridge, has been appointed an assistant in the department of botany of the British Museum (Natural History). Mr. Wilmott will devote himself especially to the European and British collections.

DR. IRVING has found the remains of another horse at Bishop's Stortford. As the bones were lying under some 6 feet of peat along with those of a small ox of the *Bos longifrons* type, it may be provisionally assumed they belong to the Neolithic age.

AT the recent annual meeting of the Paris Society of Friends of Science, Prof. M. L. Joubin, the general secretary of the society, announced that during the preceding year 80,000 francs had been distributed to men of science and their families who were in need.

THERE will be a meeting of the Biochemical Club at the Rothamsted Experimental Station, Harpenden, Herts, on Saturday next, June 10. The director and staff of the station have kindly consented to conduct members round the various plots in the morning and in the afternoon. The honorary secretary of the club is Mr. R. H. Aders Plimmer, University College, Gower Street, W.C.

THE death is reported of Mr. Samuel Hubbard Scudder, the veteran American naturalist, in his seventy-fourth year. Nearly fifty years ago he was a museum assistant to Louis Agassiz. He subsequently held various posts in connection with the Boston Society of Natural History, the Harvard University Library, and the U.S. Geological Survey. He had a wide reputation as an entomologist, particularly on account of his numerous volumes on butterflies.

IN a recent letter to *The Times*, Prof. Marcus Hartog directs attention to the fact that there is no provision made in the new Copyright Bill in reference to reproduction on lantern-slides for teaching by recognised teachers. He points out that an actual researcher is usually gratified at the implied recognition of his work when it is utilised by others, and that permission to copy the figures in original papers is not, as a rule, asked for, save, perhaps, as a matter of form. But with reference to standard textbooks there seems to be much doubt. Prof. Hartog asks, "Would it not be possible to insert a clause specifying that unless the right were expressly reserved, no prosecution would lie for the making, obtaining, and using of lantern-slides taken from a publication by or for a recognised teacher for class demonstration or the illustration of a paper before a learned society?"

An appeal against the use of the New Forest for military manœuvres, signed by a large number of distinguished zoologists, botanists, ornithologists, entomologists, and other naturalists, appeared in *The Times* of June 2. The appeal, after referring to the use of the New Forest in this way in May, points out that May and June are exactly those months of the whole year in which non-disturbance is of vital importance to the birds, insects, and plants which give to the New Forest its unique interest, not only for men of science, but for all educated persons who take an interest in natural history. The damage done by bodies of troops during this period must inevitably result in a destruction of the wild life of this area that can never again be repaired. The signatories recognise that manœuvres must be held, but express the wish that wild tracts of country other than the New Forest might be utilised for the purpose; and, if this cannot be, that future manœuvres may at any rate be deferred until after July 15, when less harm would be done.

A spell of exceptionally bright and warm weather was experienced over the British Isles at the close of May and at the beginning of the present month, and some exceptionally high temperatures for the time of year have occurred. For thirteen consecutive days, from May 25 to June 6, the shade temperature at Greenwich exceeded 75°, and on June 5 the thermometer registered 84°, which is 1° warmer than any previous reading on the corresponding day since 1841. A heavy thunderstorm occurred in and around the metropolis on May 31, when the rainfall at Greenwich measured 1·0 inch and at Epsom 2·86 inches, of which 2·44 inches fell between 5.20 p.m. and 6.10 p.m. The summary of the weather for the week ending June 3 issued by the Meteorological Office shows that extreme temperatures of 80° and above occurred during the period in nearly all parts of Great Britain, whilst the mean temperature for the week was largely in excess of the average over the entire kingdom, the excess amounting to 9·9° in the west of Scotland to 8·4° in the north-west of England, and to 8·2° in the south-west of England. The bright sunshine exceeded 70 per cent. of the possible duration in nearly all districts. May was exceptionally bright and warm, and at Greenwich the mean temperature was 5° above the normal, whilst on fifteen days the shade thermometer exceeded 70°, and on five days towards the close of the month the thermometer in the sun's rays exceeded 140°. The aggregate rainfall for the month was 1·88 inches, of which 1 inch fell on May 31, and in all rain only fell on nine days. The duration of bright sunshine was 212 hours, which is twenty-five hours more than the average.

The death is announced of Dr. J. C. Oman, author of several books on Indian customs and beliefs, at seventy years of age. From *The Times* we learn that in 1877 Dr. Oman joined the staff of the Lahore Government College as professor of natural science. In the Punjab capital, where he remained for twenty years, he won the esteem and regard of a great number of Indians of all castes and creeds by his sympathetic interest in their doings. When he retired from the Government service he was appointed to the principalship of the Khalsa (Sikh) College at Amritsar, and held the position for two years. His first book, "Indian Life, Religious and Social" (1889), was also, in a much revised and enlarged form, his last, for three years ago it was again issued under the title of "The Cults, Customs, and Superstitions of India." Among his other works are "The Great Indian Epics," which was included in Bohn's Standard Library, "Mystics, Ascetics, and Saints of India," and "Brahmans, Theists, and Muslims of India." Dr. Oman was a Fellow of the Linnean Society; and in recognition of his contributions to Indian ethnology, the degree of D.Litt. was conferred upon him by the Punjab University.

In connection with the recent discovery of remains of Palæolithic man in Jersey, the elaborate monograph by MM. M. Boule and R. Anthony on the skull found at La Chapelle-aux-Saints, published in the March-April issue of *L'Anthropologie*, is of more than ordinary interest. The morphological characteristics of this specimen are very remarkable, and in its simian type it is intermediate between man and the anthropoids. The writers thus record the result of their examination:—"L'encéphale de l'Homme fossile de la Chapelle-aux-Saints est déjà un encéphale humain par l'abondance de sa matière cérébrale. Mais cette matière manque encore de l'organisation supérieure qui caractérise les Hommes actuels."

The question of the existence of that strange birth rite known as the Couvade among the Basque race has been again raised in correspondence in the March-April issue of *L'Anthropologie*. It is now denied that any word in the Basque language describes the practice, which is said to be opposed to the national family system. On the whole, while the extent of the area in which the practice has been alleged to prevail may have been overstated, its existence in certain districts seems to be certain. In view of the rapid modification of national customs now in progress, the writer with some force appeals for a complete re-examination of the question so far as it affects the Basque people.

The July-December (1910) issue of the Journal of the Royal Anthropological Institute, which has recently made a rather belated appearance, is full of interesting matter in connection with the problems of early man. Prof. Boyd Dawkins issues his Huxley lecture on the arrival of man in Britain in the Pleistocene age, in which he confirms his original theory, published in his book on "Early Man in Britain," issued in 1880. He still believes that the cave men have handed down their culture to the Eskimo by means of the post-Glacial hunters in northern Asia. He now so far modifies this theory as to suggest that the facts do not, as he originally supposed, imply identity of race; it may have been brought about by tribes of different race. This must, he imagines, remain an open question until we have more evidence than we now possess of the Palæolithic hunters of Siberia, as well as more evidence from the caves of Europe.

In the July-December (1910) issue of the Journal of the Royal Anthropological Institute Dr. J. H. Anderson, a promising recruit to the school of physical anthropology in Australia, subjects to a searching analysis the existing formulæ for the estimation of cubic capacity in the living, and gives the results of a series of experiments on the actual capacity as determined by the displacement method. This he follows up by a paper of more general interest on the proportionate contents of the skull as demonstrated from an examination of forty Caucasian crania received from the metropolitan hospitals and benevolent asylums of the City of Melbourne. The results are that the brain volume probably decreases with advancing age; that the variation in the volume of the brain is compensated by an inverse variation in the amount of cerebro-spinal fluid present; and that the dura mater does not vary in proportionate volume with increasing age, but remains constant with a volume from about 4·5 to 5·5 per cent.

IN *The Malaya Medical Journal* for April (vol. ix., part ii.) Mr. E. D. Whittle directs attention to what is undoubtedly a description of sleeping sickness published in 1721. It is by a surgeon of the Royal Navy named John Atkins, who in that year sailed to the Guinea coast, and subsequently published a book, "The Navy Surgeon," in 1732, which in an appendix contains a chapter on "the sleepy distemper." This is probably the earliest account of the disease that has yet been found.

IN the Bulletin of the Johns Hopkins Hospital for April (xxii., No. 241), Drs. Margaret and Warren Lewis record experiments on the growth of embryonic chick tissues in artificial media. The medium which gave the best results consisted of a mixture of Ringer's saline solution with a little agar and bouillon. In this a fragment of liver from a nine-day-old chick embryo enlarged to four times the original size in forty-eight hours, and the cells of the tissue radiated and migrated into the media and showed all forms of mitotic figures.

IN a lecture delivered to the Manchester Clinical Society on the life-history function and inflammation of the appendix (and now issued in book form), Mr. E. Comer points out that appendicitis first became frequent in America at a time more or less contemporaneous with the preparation of flour in steel roller mills; in England the disease approximately dates from the introduction of this milled American flour, and among the blacks in America it similarly appeared when the milled flour became so cheap that it was simpler for them to buy their bread than to take the trouble to prepare their own. It is a curious coincidence if nothing more.

IN a circular (No. 110) issued by the United States Department of Agriculture on food customs and diet in American homes, the author, Dr. Langworthy, points out how frequently erroneous statements regarding food and diet are made. Thus it is commonly said that the Chinese and other Oriental races live on a few handfuls of rice a day. Actually, rice with them takes the place of wheat with us as the chief source of starchy food, and is largely supplemented with other food-stuffs. Likewise, if due allowance be made for difference of body-weight, the American professional and business men and Japanese of similar employment consume a diet very similar in amount of protein and number of calories of available energy.

IN No. 1828 (vol. xl., pp. 429–33) of the Proceedings of U.S. National Museum Mr. R. L. Moodie describes a third specimen of a salamander (*Eumicrerpeton parvum*) from the Carboniferous of Illinois in which the intestinal tract is preserved. The new specimen is larger and more developed than either of the other two. All three appear to be females, and not one shows any traces of branchiæ. In the new specimen the intestine is longer and more convoluted than in the others, lying in five longitudinal folds and ending in a cloaca, near which are impressions of two glands, provisionally regarded as the terminations of oviducts. Eumicrerpeton is a member of the Branchiosauria. Mr. Moodie also describes a microsaurian from the same formation, referred to the genus Amphibamus, as *A. thoracatus*.

A NOTE on the flowering of *Davidia involucrata* in Messrs. J. Veitch's Coombe Wood nursery, communicated by Mr. W. J. Bean to *The Gardener's Chronicle* (May 27), supplies some details regarding this unique monotypic genus, which is placed in the same family with Nyssa, but is not very closely related. The solitary pendulous flower, produced terminally on the branch, has two showy white bracts which subtend a conical receptacle bearing numerous stamens; arising out of the centre of the receptacle is an egg-shaped ovary surmounted by a few apparently barren stamens and several stigmas. The tree now flowering was raised from seed ten years ago, and has meantime reached a height of 14 feet; root pruning in the winter of 1909 may have induced premature flowering.

A MEMORANDUM compiled by Mr. F. Booth-Tucker with the object of promoting the more extensive planting of Eucalyptus trees in India has been issued as Bulletin No. 21 of the Agricultural Research Institute, Pusa. Failure in the past being attributed to the selection of unsuitable species, the chief object is to provide a list of suitable species and to indicate the conditions required individually. The species *amygdalina* is strongly recommended, both on account of its hardy nature and also for its economic value; *globulus*, the blue gum, requires a tolerably even climate such as that of the Nilgiris; *marginata*, jarrah, is only suitable for humid regions near the coast; *goniocalyx* is recommended for general forest cultivation.

IN connection with the dispersal of fruits and seeds by ocean currents, the example most commonly quoted is that of the coconut, and the coconut palms growing on Krakatau since the eruption are attributed to this agency. This opinion has been previously combated by Dr. O. F. Cook, and he returns to the same charge in a recent number of the Contributions from the United States National Herbarium (vol. xiv., part ii.). His evidence is first directed towards refuting de Candolle's views pointing to the original home of the plant in the Old World, and controverting arguments, amongst others, are taken from a manuscript published in 1625, and the description by Cieza de Leon in the sixteenth century. Then, proceeding from the fact that all other species of Cocos and all species of closely allied genera are natives of South America, the author submits the argument that the coconut palm is a native of inland temperate plateau regions in South America, for which contention notes and illustrations are supplied of coconut palms growing in inland districts in Guatemala.

GEOGRAPHICAL distribution and morphological modifications developed in species of Pelargonium form the subject of a paper by Dr. R. Knuth published in Engler's *Botanische Jahrbücher* (Beiblatt No. 103). The genus, comprising about 250 species, is almost entirely confined to Africa, where the chief centre of distribution lies in the extreme south-west. Annuals are few in number and confined to one section; they are characterised by having a short spur. Modifications are most pronounced in the perennials, and are mostly of a xerophytic nature. A string of tuberous thickenings—starch storing—are occasionally formed on the underground stem, and in *Pelargonium moniliforme* several such nodosities lie one above the other. In *P. squamulosum* an apparent collar is produced by the shrinkage of the cortex. In other cases the thickening occurs on the lower aërial portion of the stem, as in the section Otidea, and serves for water storage. Woody development of the petioles becomes most evident when the blade falls away and the petiole persists as a spine, as in *P. spinosum*.

DR. MILBURN has recently issued his reports on field trials with oats, mangolds, and nitrogenous manures carried out at various centres in Lancashire. The work is still in progress, but it was thought advisable to publish the available information for the benefit of farmers during the coming season. Demonstrations of this kind have been found of considerable benefit to the farmer, as they deal with problems that he cannot solve by himself, but that affect his profits considerably.

THE South African Association for the Advancement of Science issues each month *The South African Journal of Science*, containing original papers by its members, and notes extracted from other sources. No. 5 of the Journal contains an account by Messrs. Lundie and Hallack of seaweeds as manure, illustrated by several analyses of South African seaweeds. A new Cape thermal chalybeate spring is described by Mr. Rose; it contains 1·7 grains of ferrous carbonate and 25·7 grains of sodium chloride per gallon, and has a temperature of 129° Fahr. It is being exploited for curative purposes. There is also an article by Profs. Gilchrist and Thompson on the Cape klip-fishes (Clinus).

THE value of nicotine as an insecticide has long been recognised. A wash containing one ounce in ten gallons of water kills many of the worst insect pests that trouble the fruit- and hop-grower, including the apple sucker (*Psylla mali*), all kinds of aphides (Aphididæ), thrips or thunder-flies (Thripidæ), the larvæ of the winter moth (*Cheimatobia brumata*), and most young caterpillars. But unfortunately nicotine is too expensive for common use at present, and its price seems likely to rise, since it is now in demand for sheep-washes; the only hope for a fall in price is the more extended cultivation of tobacco. Experiments by Mr. Garrad at the Wye Agricultural College indicate that coarse varieties of tobacco can be grown here to produce nicotine at a rate much below the present market price.

The Agricultural Ledger, No. 3, issued from the Indian Government printing office, contains an account of the soya bean in India, by Mr. David Hooper, of the Indian Museum, Calcutta. Although the crop is not indigenous to India (its home being the extreme east of Asia), it has long been cultivated by certain hill tribes, mostly of Mongolian origin. Only recently, however, have any attempts been made at cultivation on the large scale, and it is not yet clear how far it is likely to succeed. Mr. Hooper points out several advantages of the crop: it is highly nitrogenous, and is therefore a valuable article of human diet in rice-eating countries; it can be made into certain food preparations—the Japanese make a soy-bean milk, a soy-bean cheese, and the shoyu sauce—and it also constitutes excellent cattle food, either in the unripened state as hay or as an oil cake. Numerous analyses of samples of the beans grown in India are given.

AN insect pest known as the froghopper has for some years been a source of serious trouble to the West Indian sugar planters. Not only does it cause a reduction in the weight of cane per acre, but it also adversely affects the quantity of sugar per ton of cane and the purity of the juice. The insect has now been identified by Mr. F. W. Urich as *Tomaspis varia*, Fabr., and a complete account of present knowledge of its life-history, its effect on the cane, and methods of control is given by Dr. L. H. Gough in Bulletin 67 of the Department of Agriculture for Trinidad. In the same publication Mr. Urich describes the cacao thrips (*Heliothrips rubrocinctus*, Giard), and gives some well-drawn coloured illustrations of the insect and the damaged pods and leaves.

AMONG various useful items contained in the meteorological charts of the North Atlantic and Indian Oceans for the month of June, issued by the Meteorological Committee, there is an interesting article on the phenomenon known as St. Elmo's Fire or corposants (*corpus sanctum*), the harmless luminous electricity of low intensity seen sometimes at night on ships' masts, &c., during unsettled weather. Many examples of authenticated experiences in olden and modern times are quoted, *e.g.* one by Columbus in October, 1495, during a severe storm. It was then assumed that the light emanated from the saint's body, and was a sure sign that the gale was at its maximum. In Dampier's time, 1687, a display was also accepted as a favourable omen, but in this case proved to be misleading, as the force of the wind continued to increase. The phenomenon is not unfrequent on land; it was quoted by Cæsar and others. On the summit of Ben Nevis the observatory was at times ablaze with it; the observers were not in any way inconvenienced, except by a slight tickling sensation in head and hands. Its behaviour furnishes an illustration of the elementary principle relating to the action of points on electrified bodies.

As an abstract from the *Jahrbuch de Hamburgischen wissenschaftlichen Anstalten*, vol. xxvii., we have received a brochure in which Dr. B. Walter describes and discusses a number of photographs of lightning. These photographs were taken in pairs, simultaneously, one plate being exposed in a stationary camera, the other in a camera which was moved by clockwork at a known rate. In the case of a single discharge, both plates register, of course, the same form, but in the frequent event of several subsequent flashes travelling down the lane of air ionised by the first discharge, the several flashes are seen separately; knowing the rate of angular motion of the moving plate and the focal length of the objective, it becomes a simple matter to determine the intervals of time separating these several flashes. On the five plate reproductions accompanying Dr. Walter's paper, such multiple flashes, sometimes occurring with single discharges from the same cloud, are clearly shown. For one of the sets of multiple discharge shown Dr. Walter finds that the time-intervals between five flashes taking the same path were 0·038s., 0·110s., 0·163s., and 0·080s., making a total duration of 0·391s. for the whole discharge. Dr. Walter considers a number of such cases, and deduces valuable results concerning the nature, intensity, and duration of the various forms of discharge.

THE special facilities which Prof. Raoul Pictet possesses in his laboratory at Berlin for carrying out experiments on low temperatures justify the interest with which the account he gave of his work at the meeting of the Royal Society of Arts on May 17 has been received. The experiments cover a wide field, but they centre round the fact that chemical processes which take place with freedom at ordinary temperatures are completely stopped at low temperatures, and for each process a temperature can be found for which it is just possible for it to occur. The determination and tabulation of these temperatures would, in the opinion of Prof. Pictet, constitute an important advance towards a dynamical theory of chemical processes. Such a theory, he points out, was published by him in the *Archives des Sciences phys. et Nat.* thirty-two years ago. It is founded on the definition of temperature as the mean amplitude of the vibratory oscillations of the molecules of a body, and of specific heat as the mean attraction of the body on the molecule. By means of these definitions he arrives at the conclusion that all physical and chemical phenomena can be accounted for by the existence of two distances apart at which two attracting masses will be in stable equilibrium, and a third intermediate distance at which they are in unstable equilibrium. As Prof. Pictet's definitions differ so materially from those generally accepted at the present time, and his method of deduction is not very conclusive, or even at times clear, the theoretical portion of his address falls far behind the experimental in point of interest and importance.

THE launch of the *Titanic* took place at Belfast on May 31, and forms the subject of an illustrated article in *The Engineer* for June 2. The arrangements for launching were similar to those of the *Olympic*, and the ship took sixty-two seconds from the first movement until she was afloat. The launching weight was 25,000 tons. The hydraulic rams fitted in order to start the ship were not requisitioned. We understand that the *Olympic* has completed most satisfactory trials, and has been handed over to her owners a month before her time.

Engineering for June 2 contains an illustrated description of the yacht *Progress*, fitted with 100 indicated horsepower gas engine and produced and owned by the Empire Oil Engine Syndicate, Ltd., of London. Owing to the cost of oil fuel in many parts of the world, it seems certain that marine internal-combustion engines must be capable of using gas derived from ordinary coal. The engines of this yacht are on the two-cycle double-action principle, driving the propeller direct without the interposition of any gearing. The gas supply is from a suction producer, which has been worked with anthracite, with coke, and with coalite. The patentees are convinced that their accumulated experience will enable them to supply a producer capable of working satisfactorily with ordinary steam coal. The engines are so arranged as to secure great ease in manipulation; as instancing the handiness of the engines, it may be stated that, on coming out of dock on one occasion, twenty-six different movements were made in the course of twenty-one minutes. The time taken to reverse has been found to be from three to four seconds after the order is given. It is intended to build a second engine to develop from 350 to 400 horse-power, and a corresponding gas plant, in both of which a number of improvements in detail will be embodied. This plant will be fitted on board a vessel of the commercial type.

A "GRAPH TEMPLATE," designed by Mr. J. T. Dufton, by means of which standard rectangular hyperbolas and parabolas of large size can be drawn readily on squared paper, has been put upon the market by Messrs. Macmillan and Co., Ltd. The price of the template in transparent celluloid, with instructions, is 6*d.* net, and in nickel-plated metal 3*d.* net.

BY a printer's error, the inscriptions of the two illustrations from "Kearton's Nature Pictures" reproduced in last week's NATURE (p. 450) were unfortunately transposed.

OUR ASTRONOMICAL COLUMN.

NOVA SAGITTARII NO. 4.—Circular 164 of the Harvard College Observatory announces the discovery of yet another nova in the constellation Sagittarius. This object was found by Miss Cannon during a rapid comparison of various photographs of the Harvard Map of the Sky on Map 43. It appears on eleven photographs taken between May 22 and July 9, 1901, but no trace of it can be found on 148 other plates taken in 1892, 3, 5, 6, 7, 8, and 9, and each year from 1900 to 1910 inclusive; each of these shows the C.D.M. star −27°12411, of magnitude 9·7, with which the nova at its maximum was equal in photographic magnitude. The exact date of the nova's appearance cannot be fixed, but the greatest observed brightness was 10·3 on May 22, 1901, and it is not shown on a plate taken on April 10, 1901, although this plate shows a fourteenth-magnitude star 0·3′ south of the nova. The fluctuations of brightness appear to be somewhat similar to those of Nova Persei (2). It is of interest to note that seven novæ are now known to have appeared in the region covered by Map 43.

THE MECHANICAL PRODUCTION OF THE STREAMERS SEEN IN THE SOLAR CORONA.—In order to test the theory that the shapes of observed coronal streams may be accounted for on the assumption that they are the natural production of certain defined mechanical forces, Prof. J. A. Miller examined the excellent series of corona photographs now available at the Lick Observatory, and he publishes the results of his discussion in No. 4, vol. xxxiii., of *The Astrophysical Journal.*

If the streamers are formed of particles ejected from the sun under the influence of the solar rotation, of the attraction and of the radiant pressure of the sun, certain shapes should theoretically ensue, and the velocity and direction at any point of the stream can be calculated. Prof. Miller has done this, and finds that not only do the observed streamers largely conform with his theoretical results, but he is able to compute and draw theoretical streamers, for the conditions obtaining at any one eclipse, which agree with those actually observed. Various modifications occur, but may be accounted for by reasonable assumptions of modified conditions; for example, the particles at the end of a stream are probably finer than those at the base, and therefore the sun's radiant pressure would act more strongly on them, or it may be that the particles of a stream are moving in a resisting medium which is denser in the inner than in the outer corona, and each of these causes would produce the differences observed between the computed and the observed results.

THE GENERAL PERTURBATIONS OF EROS.—A lengthy discussion of the general perturbations of the planet Eros is published by Herr H. Samter in No. 4498 of the *Astronomische Nachrichten.* The author tabulates his results for the combined perturbations by Jupiter, Saturn, and Venus, which were easily determined by Hansen's method, and in further tables gives the results of the earth's perturbations and those of Mars.

DETERMINATION OF THE APEX.—From the study of 620 stars having large proper motions, Dr. A. Wilkens has made a new study of the position of the apex. The stars are given in the Wilkens catalogue of 620 stars between 29° 50′ and 35° 10′ N., for 1875, and the Leyden A.G. catalogue, and include 267 having proper motions of 0″–5″; 173, 5″–10″; 76, 10″–15″; 35, 15″–20″; and 69 greater than 20″ per century. They also include 233 stars brighter than 8·5, but mostly fainter than 7·5, mag., 282 between 8·5 and 9·0 mag., and 105 fainter than the ninth magnitude. The resulting value for the position of the apex is A=286°, D=+37°, which is in good agreement with most modern estimations (*Astronomische Nachrichten*, No. 4499).

THE SPECTRA OF COMETS.—Visual observations of the spectra of comets 1908 III. (Morehouse), 1909*c* (Halley), and 1910*a*, are recorded by Herr von Konkoly in No. 4499 of the *Astronomische Nachrichten.* Bands were measured at 561·0 μμ, 544·0 μμ, and 515 μμ in the spectrum of 1908 III. on September 18, 1908, their respective intensities being 0·4, 0·6, and 1·0; the same bands were seen on September 22, but the wave-length in each of the last two was 1 μμ less. The red end of the spectrum was much brighter than the violet, and of the band at 470 μμ there was no trace.

Halley's comet on February 12 and May 26, 1910, gave a faint spectrum in which the same bands, with slightly varying wave-lengths, were seen. With a larger instrument, two other bands at 586·0 μμ and 472 μμ were seen, and possibly a third at 482 μμ. The bands were very bright while the continuous spectrum was abnormally faint. From nineteen separate observations, the wave-lengths of the bands in Halley's comet were found to be 586·0, 561·5, 543·7, 514·7, and 472·0 μμ.

The spectrum of comet 1910*a* gave bands at 556·0, 537·0, 512·0, and 481·0 μμ.